

ALASKA DEPARTMENT OF FISH AND GAME  
DIVISION OF COMMERCIAL FISHERIES

NORTON SOUND DISTRICT  
SALMON REPORT  
to the  
Alaska Board of Fisheries  
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Nome Area Office:  
P.O. Box 1148  
Nome, Alaska 99762

Area Management Biologist  
Assistant Mgmt. Biologist  
Clerk Typist

Leonard Schwarz  
Charles Lean  
Jana Perkins



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### III. Background

#### A. District and Subdistrict Boundaries

The Norton Sound district includes all waters from Canal Point Light north to Cape Douglas. This district is subdivided into six subdistricts: Nome (subdistrict 1), from Penny River to Topkok Head; Golovin Bay (subdistrict 2), from Rocky Point to Cape Darby; Moses Point (subdistrict 3), from Elim Point to Kwik River; Norton Bay (subdistrict 4), from Kuiktulik River to Island Point; Shakttoolik (subdistrict 5), from Cape Denbigh to Junction Creek; and Unalakleet (subdistrict 6), from Junction Creek to Black Point (Figure 1).

Each subdistrict contains at least one major salmon spawning stream. Commercial fishing effort occurs in marine waters usually near stream mouths. Subdistrict boundaries were established around the major productive streams in an attempt to minimize interception of stocks bound for other areas. Subdistricts are managed independently based on the status of local stocks and fisheries. Gillnets are the only legal commercial fishing gear.

#### B. Management Objectives and Strategies

The Division of Commercial Fisheries of the Alaska Department of Fish and Game is responsible for the management of commercial and subsistence fisheries in Norton Sound. The main objective of the Department's program is to manage both fisheries on a sustained yield basis in accordance with policies set forth by the Alaska Board of Fisheries, including assignment of subsistence fishing as the highest priority among beneficial uses of the resource. Spawning escapements in major rivers are monitored through aerial surveys counting towers and sonar. In most cases escapement goals can be achieved, and therefore the potential for a sustained yield assured, through scheduled weekly closures of the commercial fishery. Subsistence fishing is allowed seven days per week in both marine and river waters with no catch limits, except in the Nome subdistrict where subsistence as well as commercial fishermen must be limited by periodic closures and catch limits so that escapement goals may be reached.

All five species of Pacific salmon occur in Norton Sound. Pink salmon are the most abundant followed by chum, coho and king salmon. Red salmon occur only rarely. Chum salmon are the most economically important species followed by king, coho, pink, and red salmon.

Regulations provide for the commercial fishing season to be opened by emergency order between June 8 and June 20. The arrival of salmon in Norton Sound is greatly influenced by ice break up and the season is not opened until fish are present on the fishing grounds in harvestable numbers and have started their upstream migration. The timing and abundance of the king salmon run is monitored in Unalakleet by a fisheries technician and a test net crew operating in the Unalakleet River. Fishermen throughout Norton Sound are encouraged to relay subsistence catch data early in the season to department representatives.

During early break up conditions, the commercial season will be opened before June 15, the midpoint of the opening date range, on a subdistrict by subdistrict basis if increasing catches are made for a 7 day period. If the season is opened early, initial fishing periods may be only 24 hours in duration until additional run strength information is obtained. If a normal or late break up occurs, the season will be opened on or after June 15, the exact date based on run timing and abundance. The published fishing schedule is four days a week, 6:00 p.m. Monday to 6:00 p.m. Wednesday and from 6:00 p.m. Thursday to 6:00 p.m. Saturday. This schedule is usually followed except in the Nome and Moses Point subdistricts where intense fishing pressure, small local stocks, or expected poor runs have resulted in decreased fishing time. Commercial fishing in the Nome subdistrict has been closed when the regulatory 5-15,000 chum salmon harvest guideline for this subdistrict has been reached. Commercial fishing time in the Moses Point subdistrict is regulated by emergency order, initial fishing time consists of two 24 hour periods a week and subsequent fishing time is adjusted so that minimum escapement goals are met.

Adjustments in fishing time for other subdistricts may be required for conservation purposes if run magnitudes are below average and fishing effort remains high. Effort, catch and escapement data will be compared with previous seasons to judge relative run magnitudes of the current season.

The pink salmon run usually begins in early to mid July, shortly after the king and chum runs have started to peak. When exceptionally large pink salmon runs occur, additional fishing periods are provided when only gillnets with 4-1/2" mesh or less may be fished. These additional fishing periods, coupled with mesh restrictions, are an attempt to allow for the harvest of surplus pinks without overharvesting chum stocks. A regulation adopted in 1981 provided fishermen with the option of setting or drifting their 4-1/2" mesh gillnets during these special periods. Pink salmon gear takes fewer total numbers of chum salmon, but takes a larger percentage of female chums. In subdistricts where low chum salmon escapements are occurring, additional pink gear periods are delayed until most chum salmon have entered spawning streams. These additional openings with small mesh gillnets are usually terminated about August 1 when the pink run has greatly diminished.

Coho salmon return during August and all subdistricts, except the Nome subdistrict, are scheduled by regulation to two 48 hour fishing periods per week. The Nome subdistrict commercial fishery is scheduled for two 24 hour periods per week due to intense subsistence and sport fishing pressure on local stocks which are not abundant.

#### C. Status of Fishery and Stocks

##### KING SALMON

There is a directed king salmon fishery in Shaktoolik and Unalakleet subdistricts. Commercial quantities of king salmon do not occur north of the Shaktoolik subdistrict. During the first three years of the

fisheries, (1961-1963), annual catches averaged about 6,000 kings. The following 14 years (1964-1977) the commercial catch averaged about 2,000 kings. Since 1978, average annual king salmon catches have increased to about 8,000 fish. Subsistence catches have also increased with an average of about 1200 kings over the last 5 years. (Table 1).

#### CHUM SALMON

Chum salmon is the primary commercial species throughout Norton Sound. Catches were large during the first four years of the fishery (1961-1964) averaging about 134,000 fish annually. Annual catches dropped to an average of 66,000 fish during 1965-1970. Since 1970 chum catches have been fairly stable averaging about 160,000 fish. Subsistence catches have ranged from 4,000 to 33,000 chum salmon. Subsistence catch figures are not as accurate as commercial catch figures due to the method by which they are collected. The 1981 and 1982 subsistence catches were the largest and fourth largest on record respectively (Table 1).

Chum salmon escapements during the last several years have been difficult to monitor by aerial surveys due to the large number of pink salmon also present on the spawning grounds. Chum salmon escapements have been best documented in the Kwiniuk River of the Moses Point subdistrict where the department has operated a counting tower since 1965. Escapement results are presented in Table 5. In an effort to further document chum escapement, the department operated a side scan sonar in the Unalakleet River for the first time during the 1982 season. The feasibility of this project is still under consideration.

#### PINK SALMON

Annual pink salmon catches have ranged from 200 to 325,000 fish. During the past five years pink salmon stocks have increased greatly. Pink salmon counts in the Kwiniuk River reflect this district-wide trend (Table 5). Commercial catch statistics do not accurately reflect pink salmon run size because the lack of a market is often the limiting factor in the sale of pink salmon. During the past several years the department has provided additional fishing periods with gillnets of 4-1/2" mesh or less during these large pink salmon runs. Effort has been non-existent in many subdistricts during the periods due to weak pink salmon markets.

Subsistence fishermen utilize pink salmon to prepare "dried fish". Subsistence catch increases over the past five years have reflected the strong pink runs, averaging 42,000 fish. During the preceding fifteen years subsistence catches averaged 18,000 pink salmon (Table 1).

Aerial survey, tower, and sonar counts have documented large spawning escapements of pink salmon. During 1980, pink salmon escapement in Norton Sound streams was estimated to be five million. Escapement in 1981, was excellent in some streams, but only fair in others. Record pink salmon escapements were recorded in 1982 with over 7 million pink salmon observed in the streams that were surveyed. Pink escapement was so large that the enumeration of other species was difficult.

## COHO SALMON

Commercial coho catches averaged about 6,000 from 1961-1978. Coho returns home increased greatly since 1978 and the average catch for the 1979-1982 period is 46,000 fish. The coho distribution in Norton Sound is similar to that of king salmon. The Unalakleet and Shaktoolik subdistricts usually take more than 90% of the total catch. Strong coho runs coupled with strong markets have caused an increase in fishing effort during August. The recent economic importance of the coho harvest in the Shaktoolik and Unalakleet subdistricts rivals or surpassed that of the king and chum salmon harvests (Tables 2 and 3).

Subsistence catches also reflect the increasing trend of coho abundance. Coho catches averaged 2,000 fish during the first 16 years that subsistence catches were monitored (1963-1978). Subsistence coho catches since 1978 have increased averaging 12,000 fish annually. (Table 1).

Aerial surveys for coho salmon are not conducted in most Norton Sound streams, however, comparative catch statistics, for the past several years indicate that escapement levels were probably adequate.

### IV. Season Summary

#### A. Harvest, Effort, and Economic Value

A late break up in Norton Sound delayed the commercial fishery emergency order opening in all subdistricts until June 17. The season closed on September 4.

The 1982 district catch totalled 511,208 fish comprised of 5,892 king, 230,281 pink, 183,335 chum, 91,690 coho, and 10 sockeye salmon. This total catch was 1.3 and 1.6 times greater than the recent 5 and 10 year averages, respectively.

The king salmon harvest was below the recent 5 year average, but slightly above the recent 10 year average. The pink, chum, and coho harvests were above the recent 5 and 10 year averages with the total coho catch nearly triple that of the 1981 record catch of 31,500 fish. The harvest of all species combined was the second largest on record. Historical catch data for the district is presented in Table 1.

A total of 196 CFEC permits were renewed for the 1982 season with only 164 permits actually fished. The number of participating permit holders has remained stable over the last five years and has averaged 167. Fishing effort and catch by subdistrict is presented in Table 2.

Seven processors operated in Norton Sound during 1982. In addition, Nome subdistrict fishermen sold salmon to individuals, restaurants, and grocery stores both locally and in Anchorage. Commercial fishermen received approximately \$998,588.00 for their catch; the most on record for this fishery. The previous record years were 1978 and 1979 when fishermen received \$814,000 and \$877,000 respectively.



pound for chums, \$.12 per pound for pinks, and \$.57 per pound for cohos, (Table 3).

Escapement data for 1982 is presented in Table 4.

B. Special Management Problems

1. Nome-subdistrict 1:

Due to poor chum escapement in local streams, coupled with the relatively large harvest of 10,970 chum salmon, the Nome subdistrict was closed to commercial salmon fishing on June 29. As studied previously, the commercial harvest guideline for chum salmon in the Nome subdistrict is 5-15,000 fish.

Commercial salmon fishing was re-opened on July 5 but with a mesh restriction of 4-1/2 inches or less. The mesh restriction was imposed in an effort to harvest pink salmon without overharvesting the chum salmon stocks. However, by July 12, there was no longer a market for pink salmon and fishing effort decreased from 14 fishermen to only 1 fisherman. The mesh restriction was lifted on August 1 and commercial fishermen were allowed by regulation to fish 2 days a week to harvest a portion of the coho salmon run.

Eighteen commercial fishermen harvested a total of 20 king, 18,512 pink, 13,447 chum, and 1,183 coho salmon. The pink, chum, and coho catches were the 2nd, 4th, and largest catches on record, respectively.

During the commercial salmon season, subsistence fishing was allowed 4 days per week, except from July 17 to August 7 when it was opened to 7 days a week due to the strong pink run. Permit renewals were allowed for the same stream during the pink run.

2. Moses Point-subdistrict 3:

Due to an expected low chum salmon return to this subdistrict, based on poor brood year escapements (1977-1979), commercial fishing began on June 17 on a reduced schedule of two 24 hour periods per week. However, by June 27, the department counting tower crew on the Kwiniuk River had counted over 11,000 chum salmon. Since it was apparent that the escapement goal of 25,000 chum would be reached even with increased fishing time, the periods were increased to one 2 day and one 3 day period a week. By July 5, 21,361 chum salmon had been counted on the Kwiniuk River, so fishing time was again increased to one 6 day period a week.

Twenty-eight fishermen harvested a total of 253 king, 9,849 pink, 40,030 chum, and 318 coho salmon. Effort was 47%

below the 10 year average, with the chum harvest 13% above the recent 5 and 10 year averages.

An escapement of 41,000 chum and 435,000 pink salmon was achieved in the Kiwiniuk River. This is the second largest escapement on record for both species. The Moses Point subdistrict was without a market for pink salmon.

### 3. Pink Salmon Openings:

During the 1982 season there were several pink salmon gear only (4-1/2 inch mesh or less) commercial openings in all subdistricts except Moses Point in addition to the regular weekly periods. These subdistricts experienced strong pink runs, and special periods were allowed in an attempt to harvest more of the abundant pink salmon. These special periods occurred from July 7 through July 29. On the whole, fishing effort was low during these periods. However, during one 12 hour pink gear period in Unalakleet, 18 fishermen harvested 22,733 pinks and 154 chum. During all the special pink salmon openings, a total of 63,104 pink and 4,348 chum salmon were landed. Again, the lack of a firm market for pink salmon is blamed for the low effort during these periods.

## V. Norton Sound District Outlook for 1983

Insufficient data is available to enable accepted forecasting methods to be employed in Norton Sound. The 1983 "Outlook" is based upon analysis of comparative commercial catch and escapement information, age data and "subjective determinations." The "Outlook" is presented only as an indicator of possible 1983 run strength.

The pink salmon return will be produced from the 1981 brood year. Pink salmon escapements in 1981 were excellent in Norton Sound index streams with the exception of the Nome and Shaktoolik subdistricts. Therefore, overall 1983 pink salmon returns should be strong.

The 1983 Norton Sound chum salmon return will be produced by progeny of the 1978-1980 escapements, with the bulk of the run being composed of the four-year-old age class from the 1979 escapement. The 1979 chum escapement was below average in the Nome, Golovin, and Moses Point subdistricts and average in the Norton Bay, Shaktoolik, and Unalakleet subdistrict. The overall 1982 chum returns may therefore be similar to these brood year magnitudes.

The 1983 coho run will be produced by the progeny of the 1979 escapement. Coho escapements were not documented by aerial surveys; however, commercial and subsistence catches were six times greater than the previous five year average. This indicates escapement was well above average and therefore the 1983 coho run may also be above average.

## VI. Anticipated Management Problems

Currently subsistence salmon fishermen in the Nome subdistrict are required to obtain permits which specify the number of salmon which may be taken. For example, a subsistence fisherman is allowed to take 250 salmon in the Nome River. During the 1982 season 87 permits were issued for this river. Permits were also renewed due to the large pink salmon run. An actual harvest of 844 coho, 6,261 pink and 332 chum was taken from this river. A total of 4 aerial surveys and a foot survey documented an escapement of 327,470 pink and only 225 chum. A permit system needs to be implemented that will prevent the overharvest of less abundant chum and coho salmon while allowing a harvest of pink salmon. Under the current permit system the 87 permit holders could have potentially harvested 21,750 salmon. The pink run could have supported a harvest of this magnitude; however, the coho and chum run could not.

If large pink salmon runs continue and markets remain limited there is the potential for considerable wastage of pink salmon carcasses. Several processors and fishermen were interested in developing a pink salmon roe fishery where only the salmon eggs would be commercially utilized. Under current regulations salmon processors are allowed to discard carcasses while fishermen are not.

Figure 1. Norton Sound Commercial Salmon Fishing Subdistricts

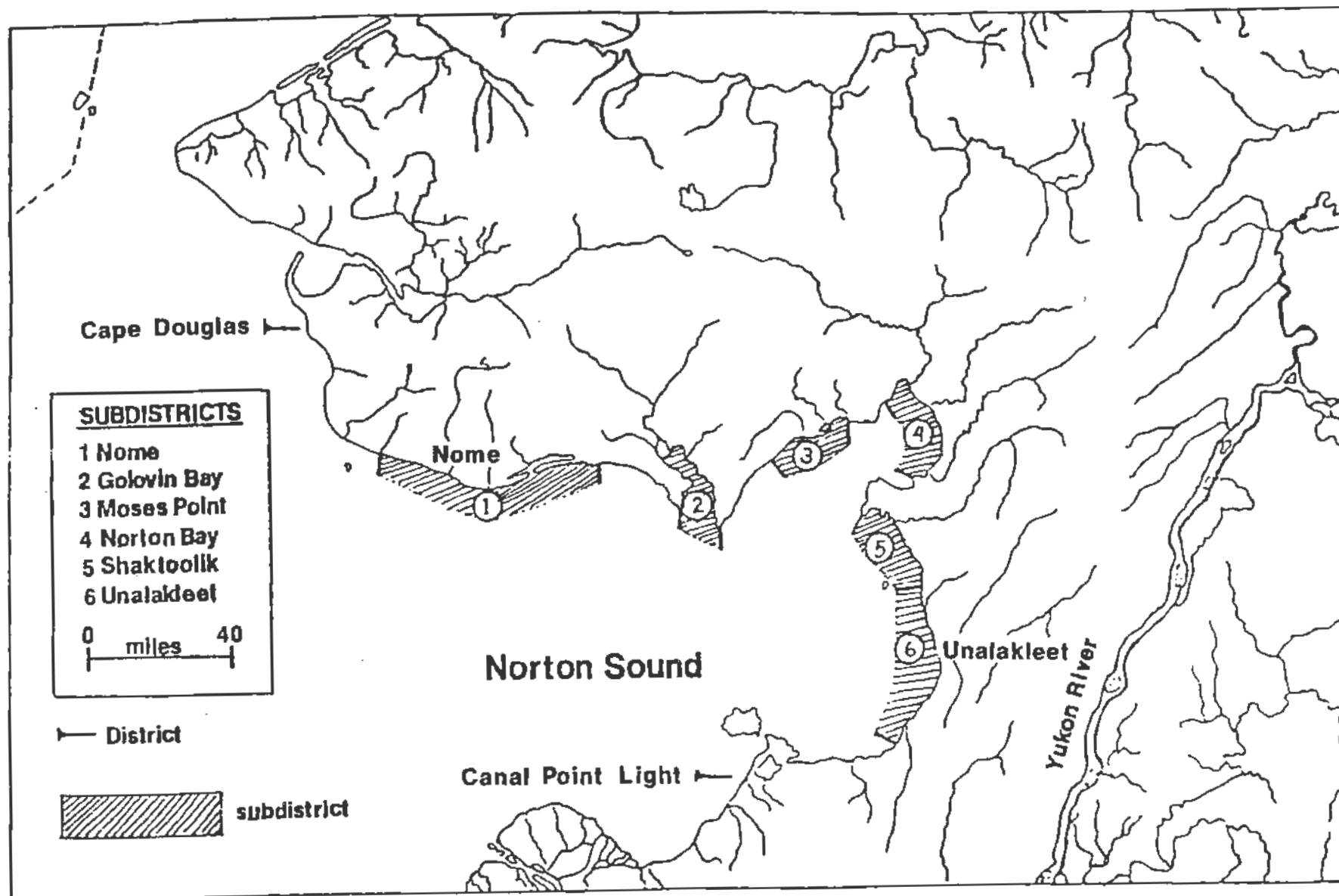


Table 1. Commercial and subsistence salmon catches by species, all subdistricts, Norton Sound district, 1961-1982

Year	Commercial						Subsistence					Combined					
	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
ALL SUBDISTRICTS																	
1961	5300	35	13807	34327	48332	101711	-	-	-	-	-	5300	35	13807	34237	48332	101711
1962	7286	18	9156	33187	182784	232431	-	-	-	-	-	7286	18	9156	33187	182784	232431
1963	6613	71	16765	55625	154789	233863	5	118	16607	17635	34365	6618	71	16883	72232	172424	268228
1964	2018	126	98	13567	148862	164671	565	2567	9225	12486	24843	2583	126	2665	22792	161348	189514
1965	1449	30	2030	220	36795	40524	574	4812	19131	30772	55289	2023	30	6842	19351	67567	95813
1966	1553	14	5755	12778	80245	100345	269	2210	14335	21873	38687	1822	14	7965	27113	102118	139032
1967	1804	-	2379	28879	41756	74818	817	1222	17516	22724	42279	2621	-	3601	46395	64480	117097
1968	1045	-	6885	71179	45300	124499	237	2391	36912	11661	51201	1282	-	9276	108091	57051	175700
1969	2392	-	6836	86949	82795	178972	436	2191	18562	15615	36804	2828	-	9027	105511	98410	215776
1970	1853	-	4423	64908	107034	178218	561	4675	26127	22763	54126	2414	-	9098	91035	129797	232344
1971	2593	-	3127	4895	131362	141977	1026	4097	10863	21815	37801 <sup>1/</sup>	3619	-	7224	15758	153177	179778
1972	2938	-	454	45182	100920	149494	804	2319	14158	13966	31247 <sup>2/</sup>	3742	-	2773	59340	114886	180741
1973	1918	-	9282	46499	119098	176797	392	520	14770	7185	22867	2310	-	9802	61269	126283	199664
1974	2951	-	2092	148519	162267	315829	420	1064	16426	3958	21868	3371	-	3156	164945	166225	337697
1975	2393	2	4593	32388	212485	251861	186	192	15803	8124	24305 <sup>3/</sup>	2579	2	4785	48191	220609	276166
1976	2243	11	6934	87916	95956	193060	203	1004	18048	7718	26973	2446	11	7938	105964	103674	220033
1977	4500	5	3690	48675	200455	257325	846	2530	14296	26607	44279	5346	5	6220	62971	227062	301604
1978	9819	12	7335	325503	189279	531948	1211	2981	35281	12257	51730	11030	12	10316	360784	201536	583678
1979	10706	57	31438	167411	140789	350401	747	8487	25247	11975	46456	11453	57	39925	192658	152764	396857
1980	6311	40	29842	227352	180792	444337	1397	8625	63778	19622	93422	7708	40	38467	291130	200414	537759
1981	7929	56	31562	232479	169708	441734	2021	13416	28741	32866	77082 <sup>6/7/</sup>	9950	94	44978	261220	202574	518816
1982	5892	10	91690	230281	183335	511208	1328	17874	56295	23185	98690 <sup>6/8/</sup>	7720	18	109564	286576	206520	609898
5-year avg.	7853	34	20773	200284	176205	405149	1244	7208	33469	20665	62594	9097	42	27981	233753	198870	467743
10-year avg.	5171	18	12722	136192	157175	311279	823	4114	24655	15824	44023	5994	22	16836	160847	171603	355302
1/	Includes 197 recorded sockeye salmon in all subdistricts										6/	These figures also include data from Stebbins and St. Michael					
2/	Includes 93 recorded sockeye salmon in all subdistricts										7/	Includes 38 sockeye salmon					
3/	Includes 11 recorded sockeye salmon in all subdistricts										8/	Includes 8 sockeye salmon					
4/	1977-1981																
5/	1972-1981																

Table 2. Norton Sound district and subdistrict commercial salmon catch and effort data, 1982

Sub-district	Fisher-men 1/	King/lbs.	Pink/lbs.	Chum/lbs.	Coho/lbs.	Sockeye/lbs.	Total/total lbs.
1	18	20/326	18512/51045	13447/99881	1183/8903	0	33162/160155
2	17	78/1130	39510/124351	51970/378663	4281/29957	5/28	95844/534129
3	28	253/3503	9849/29246	40030/288430	318/2091	0	50450/323270
4	10	96/1179	2535/7834	7128/52816	2332/16990	0	12091/78819
5	32	1677/22601	17019/54080	26240/188195	22233/157104	3/22	67172/422002
6	68	3768/68516	142856/392615	44520/330803	61343/433167	2/16	252489/1225117
Total		5892/97255	230281/659171	183335/1338788	91690/648212	10/66	511208/2743492
Avwt, for season		16.5	2.9	7.3	7.1	6.6	

1/ Several fishermen fished more than one subdistrict.

Table 3. Norton Sound district value and average price paid by species, 1982

Species	Dollar value	Average price paid
King	\$121,569	\$1.25
Pink	\$ 79,100	\$0.12
Chum	\$428,412	\$0.32
Coho	\$369,481	\$0.57
Sockeye	\$ 26	\$0.40
Total	\$998,588	

Table 4. Peak aerial survey counts of Norton Sound streams 1982.

<u>Stream name</u>	<u>Chums</u>	<u>Pinks</u>	<u>Kings</u>	<u>Coho</u>
Nome River	219	279,700		
Flambeau	5,083	25,001		
Eldorado	1,095	163,300		
Bonanza	380	67,800		
Solomon	487	54,100		
Sinuk	638	148,800		
Fish <sup>1/</sup>		241,700		
Niukluk	2,332	227,315		
Boston	1,730	22,020	10	
Tubutulik	2,044	53,530	44	
Kwiniuk <sup>2/</sup>	41,000	435,000	138	
Ungalik	290	37,650		
Shaktoolik <sup>3/</sup>	48	36,550		
Unalakleet <sup>3/</sup>	563	6,227		
North Fork <sup>3/</sup>				3,648
North River <sup>3/</sup>	599	173,352	7	
Old Woman <sup>3/</sup>	78	7,712		628
Unalakleet				
System <sup>4/</sup>	195,000	5,744,000	7,500	65,000

<sup>1/</sup> No estimate on chums due to numerous pink salmon

<sup>2/</sup> Kwiniuk reflects tower counts.

<sup>3/</sup> Surveyed after peak under poor conditions.

<sup>4/</sup> Preliminary sonar counts, (note: chum count is probably high due to the overlap in timing of the pink and chum runs)

Table 5. Kwiniuk Tower Expanded Chum and Pink Salmon Escapements, 1965-1982.

	<u>Chum</u>	<u>Pink</u>
1965	32,861	8,668
1966	32,182	10,864
1967	26,661	3,587
1968	18,976	129,052
1969	19,749	57,497
1970	68,004	235,131
1971	38,679	16,634
1972	30,686	62,461
1973	28,617	38,426
1974	35,899	40,816
1975	14,344	57,317
1976	6,466	28,087
1977	22,289	44,602
1978	11,049	70,148
1979	12,355	167,492
1980	19,374	319,363
1981	34,561	566,417
1982	44,099	469,674